



UNIVERSITEIT VAN PRETORIA
Fakulteit Veeartsenykunde

UNIVERSITY OF PRETORIA
Faculty of Veterinary Science

**PROGRAM EN OPSOMMINGS
PROGRAMME AND SUMMARIES**

**1ste Fakulteitsdag
1st Faculty Day
5 September 1984**

1st Faculty Day
Faculty of Veterinary Science
University of Pretoria
5th September, 1984

Sponsored by Wellcome/Coopers

Organising Committee

Prof J M W le Roux - Dean
Mr R Reynolds-Hale - Wellcome/Coopers
Prof W H Gerneke
Prof S van Amstel
Dr G L Coetzee
Dr B Penzhorn
Dr G V Turner - (Co-ordinator of Scientific Programme)

11h45-12h00 6 Plasma testosterone levels following GnRH stimulation in male cheetach (Acinomyx Jubatus)
Meltzer D G A and Collett F A

SESSIE 2

KLEINDIERE

VOORSITTER: Prof P Bland

12h00-12h15

7 Fiksheidsparameters in honde
Malan J H

12h15-12h30

8 Recent advances in small animal dentistry
Verstraete F J M

12h30-12h45

9 Encephalitozoonosis as a possible important cause of canine nephritis
Stewart C G and Reyers F

12h45-13h00

10 Feline plasma cell gingivitis - pharyngitis
Lange A Lucia and Baker Maureen K

MIDDAGETE/LUNCH

SESSION 3

FOOD ANIMALS

CHAIRMAN : Prof D R Osterhoff

13h45-14h00

11 Evaluating the effectivity of selenium supplementation using glutathione peroxidase as parameter of selenium status
Collett F A, Meltzer D G A, Ehret W J and Mülders M S

14h00-14h15

12 Oorsig oor proewe gedoen met sementoondstof insluiting en voeding van beeste en skape
Genis E C

14h15-14h30

13 Superovulatory response of merino ewes to three dose levels of pregnant mare serum during the breeding season
Terblanche S J, Coubrough R I and Labuschagne J L

14h30-14h45

14 The significance of morphological assessment of bovine embryos prior to cryopreservation
Coubrough R I, Gilbert, R O, Ehret W J

14h45-15h00

15 The transmission of bluetongue virus by embryo transfer in sheep
Gilbert R O, Coubrough R I and Weiss K E

ABSTRACTS/ABSTRAKTE

ANATOMIESE AANPASSINGS VAN DIE BEWEGINGSTELSEL VAN DIE KAMEEL
(Camelus dromedarius)

Smuts Malie M S

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Sowel die skelet as die spierstelsel toon unieke aanpassings wat die dier se uithou - en oorlewingsvermoë gedeeltelik verklaar. Die dwarsuitsteeksels van die nekwerwels is ventraalwaarts gerig en vorm 'n geut vir die vitale organe. 'n Dik laag onderhuidse elastiese bindweefsel is teenwoordig oor die buigvlakke van die ledemate. Die Lig. nuchae is besonder sterk ontwikkel en is aaneenlopend met die ewe-eens elastiese dorsoskapulêre ligament. Die toonkussings is gespesialiseer om as hidrolise vere te dien. Die oppervlakkige buiger van die voorpoot bestaan allenlik uit die distale peesgedeelte. Die Mm. splenius en omotransversarius is afwesig en die M. brachiocephalicus is sterk gereduseer. 'n Spier wat vanaf die atlas en die gewrigskapsel tussen die skedel en die atlas na die dak van die nasopharynx loop het geen homologe by ons ander huisdiere nie.

REPRODUKSIE EN DIE GESLAGSTELSEL VAN DIE KAMEEL
(Camelus dromedarius)

A J Bezuidenhout

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Die kameel het 'n tipiese Uterus bicornis. Die Ovaria word heeltemal omring deur die Bursa ovarica. Gedurende die teelseisoen vertoon die ovaria alle stadia van follikulêre ontwikkeling. Die gekronkelde Tuba uterina open op 'n papilla in die stomp punt van die baarmoederhoring. Die linker-horing is heelwat groter as die regter-horing. 'n Velum uteri skei die twee horings inwendig met 'n gevolglike kort baarmoederliggaam. Die eerste van die vier sirkulêre servikale voue is swak ontwikkel met 'n groot Ostium uteri externum. Die lang Vagina het lentreoue en word duidelik onderskei van die Vestibulum vaginae. 'n Vlak gleuf verbind dikwels die dorsale kommissura van die vulva met die anus. Die A. uterina is sterk gekronkel en omring die V. uterina. Die uier van die kameel bestaan uit vier kwarte. Die linker- en regter-heltes word geskei deur 'n dik gepaarde elastiese plaat. Elke speen het twee openinge. Goed ontwikkelde Mm. mammaria craniales is teenwoordig.

Die testes lê ventraal van die anus en varieer in grootte, afhangende van die seisoen. Die bykomstige geslagskliere bestaan uit die ampullae, 'n prostaat en bulbo-urethrale kliere, terwyl die fibreuse penis 'n S-kurwe het en eindig as 'n driepuntige struktuur. Die opening van die hangended preputium wys na agter, sodat die dier normaalweg tussen sy agterbene deur urineer. Paring vind plaas in 'n sittende posisie. Na 'n dratyd van ongeveer 13 maande word 'n enkele kalf gebore.

THE LANGERHANS CELLS AND THEIR IMMUNOLOGICAL SIGNIFICANCE

Gerneke W H

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The Langerhans cell, an intra-epidermal, dendritic migratory cell, which was formerly thought to be a senescent melanocyte and therefore grossly neglected, has in the last decade or so been shown to be an antigen detecting macrophage which really forms the first line in the immunological defence of the body. They are characterised by very specific penta laminated disc-shaped granules, the Langerhans cell or Birbeck granules, the origin of which has given rise to numerous speculations. It has been postulated that they originate from the Golgi apparatus or as invaginations of the plasmalemma. As a result of insufficient evidence these explanations have never really been excepted.

In an investigation carried out by the author in which they were found in the forestomach of the ruminant it was seen that these granules were identical to the desmosomal discs and that some discs were missing from the more distal regions of the epithelium. A new hypothesis was thus put forward in which it is believed that the granules are desmosomal discs, taken up by Langerhans cells as their processes were forced inbetween the epithelial cells. The importance of the granules lies in the fact that they act as markers for these cells indicating that their hosts had traversed one or other of the various types of stratified squamous epithelium of the body. The granules have no immunological significance.

As antigen detectors the Langerhans cells are evenly spaced throughout all stratified squamous epithelium. Once antigens are detected, T lymphocytes are stimulated in the proximal regions of the epithelium by cell-to-cell contact. The stimulated Langerhans cells may also migrate, via tissues or lymphatics to lymph nodes, where they become established as interdigitating dendritic macrophages and are able to initiate the necessary humoral or cell-mediated immune response. They may migrate elsewhere too. Similar antigen detecting macrophages are also found in other types of epithelium but without the granules.

SOME ULTRASTRUCTURAL FEATURES OF ABNORMAL SPERMATOZOA

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Despite the limitations imposed by relatively time-consuming preparatory procedures, both transmission and scanning electron microscopy have emerged as powerful techniques for the assessment of semen quality. The greater resolving power of the electron microscope exposes specific morphological aberrations and reveals structural defects that are often difficult to detect using conventional methods. The following defects, which may involve the head and acrosome, the tail, or both regions simultaneously, have been observed by the authors in bull, ram, dog and cheetah sperm during a series of routine investigations and experimental studies.

Anomalies of the head and acrosome: (a) Lipping of the anterior and/or lateral perimeters of the acrosome. (b) Vesiculation of the acrosome. (c) Acrosome cysts. (d) Irregularly shaped, non membrane-bound, nuclear vacuoles. (e) Nuclear invaginations, membrane-bound pouches within the nucleus which communicate with other parts of the sperm. (f) Defective chromatin condensation. (g) Gross deformities in the shape and size of the head.

Tail abnormalities: (a) Varying degrees of tail coiling, ranging from a simple loop around retained cytoplasmic remnants to a tight coiling of the tail, characteristic of the "Dag-defect". In the latter instance the coils of the tail, which often encircle the base of the head and neck region, are contained within an extended but intact cell membrane. Disruption of the axoneme, with dislodgement of individual fibres into the surrounding cytoplasmic mass, is associated with this defect. (b) The stump-tail defect in which sperm display a short malformed tail. (c) Disruption of the mitochondrial helix of the mid-piece. (d) Double tails.

The additional information provided by electron microscopy in the study of the abnormalities outlined above is essential for a more comprehensive determination of the exact nature of the sperm defect which, in turn, results in a more precise evaluation of semen quality. This enables a more accurate prognosis to be given when assessing genital soundness.

IN SEARCH OF THE FROZEN ACROSOME

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Acrosomal integrity is closely correlated to fertility. However, assessment of acrosomes has previously not been possible in frozen semen, except by means of specialised phase contrast microscopy. A stain was developed with the following objectives:

- 1) To differentiate metachromatically the acrosome from the rest of the spermatozoon.
- 2) To give accurate results on diluted as well as fresh semen.
- 3) To be usable in the field, i.e. simple, rapid, and transportable.

Spermac stain has been used over the past 18 months in the Department of Genesiology, and has consistently given good results, fulfilling the above criteria.

PLASMA TESTOSTERONE LEVELS FOLLOWING GnRH STIMULATION IN MALE CHEETAH
(Acinonyx jubatus)

Meltzer E G A and Colett F A

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Veterinary Science, University of Pretoria

The objective of the study was to determine the difference in plasma testosterone concentration, that results after GnRH stimulation, in cheetah males found to be fertile or sub-fertile by examination of semen quality. Cheetah males were caught in a crush and given Saffan intravenously. Anaesthetized animals were brought to a convenient area, bled and then given GnRH by intramuscular injection. Blood samples were taken after GnRH injection as follows: after 1 hour, 2 hours, 2½ hours, 3½ hours and 4 hours. Plasma was harvested immediately after blood collection and stored at 20° C. Radio-immunoassay for testosterone was performed on batches of 40-50 samples. Control sera being used to measure interassay variation. After initial assays the following samples were chosen: zero time and maximal measured testosterone. These samples were reassayed together in one assay procedure and the results used to make comparisons. No significant difference in maximal plasma testosterone levels achieved after GnRH stimulation can be demonstrated when comparing animals regarded as fertile and those regarded as sub-fertile. Plasma testosterone levels found in animals from different age groups do show significant differences.

FIKSHEIDSPARAMETERS IN HONDE

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Die gewone parameters om fiksheid in die hond vas te stel soos gebruik in die mens lewer tegniese probleme op. Ander parameters word dus gesoek.

Fiksheidsparameters is in verskillende honderasse in 'n gekontroleerde omgewing gemeet. Die kamertemperatuur is so konstant as moontlik gehou. Rektale temperatuur is gedurende die trappeulhardlooptydperk geneem. Hematologiese en biochemiese ontledings van veneuse bloed wat daagliks vir een week gedurende die hardlooptydperk geneem is, is gedoen.

Die rektale temperatuur van honde blyk 'n baie betroubare parameter te wees om fiksheid in honde te bepaal, en om vas te stel wanneer werk/oefening gestaak moet word. Die bloedglukose/totale plasmalipiedes toon afwykings, wat moontlik aan die fiksheid/werkvermoë van honde gekoppel kan word.

Na strawwe oefening daal die hond se kosiname en herstel eers weer na twee/drie dae. Sommige van hierdie resultate lyk belowend.

RECENT ADVANCES IN SMALL ANIMAL DENTISTRY

Verstraete F J M

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Dentistry was until recently a neglected field of veterinary science, except at a few overseas universities. Veterinary dentistry was limited to tartar removal and tooth extraction, using primitive techniques and equipment. The advent of a Dental Clinic within the Department of Surgery has opened up this field. In 1981 three cases were presented for dental treatment. In 1982 when the project was started, 30 cases were seen. In 1983 the Dental Clinic was fully operational and 98 cases were presented. Materials and instruments used in human dentistry are being employed. At present all aspects of dentistry are covered, but most cases are presented for periodontal or endodontal treatment.

Besides ultrasonic scaling, routine periodontal treatment includes the use of techniques such as gingivectomy, tooth neck correction, root planing and polishing of teeth. The standard of tooth extraction is considerably raised and techniques such as gingival flaps, alveolotomies and tooth-splitting are routine procedures. These techniques prevent to a greater extent complications such as fractured roots and persistent infection. Endodontal treatment encompasses the conservative treatment of fractured tooth includes removal of the pulp content, obliteration of the root canal and sealing of the root canal opening, using amalgam or the tooth is completely restored with a prosthetic crown. Caries is rare in domestic animals, except in the cat, but can be treated conservatively with an amalgam or composite filling. Orthodontics, or the correction of occlusal abnormalities, gives rise to serious technical problems. In dental orthopaedics certain new non-invasive techniques have been introduced in the treatment of mandibular and maxillary fractures. It is demonstrated that, by adopting certain techniques from human dentistry, the standard of veterinary dentistry can be raised considerably. The marked anatomical differences should however always be taken into consideration. The ever increasing number of cases indicates that there certainly is a need for advanced dentistry and that the public makes use of this service when it is offered.

ENCEPHALITOOZONOSIS AS A POSSIBLE IMPORTANT CAUSE
OF CANINE NEPHRITIS

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Azotaemia is commonly found in dogs without being able to establish an aetiological diagnosis. In many cases, particularly in the case of chronic interstitial nephritis, the initial lesion probably occurred a long time before any clinical signs are observed. Possible causes are leptospirosis, which is rarely diagnosed in the Pretoria area, Ehrlichia canis, which is commonly diagnosed and encephalitozoonosis which is being diagnosed with increasing frequency.

In order to establish the importance of Encephalitozoon cuniculi infection as a possible aetiological agent in the cause of nephritis, 42 serum samples were obtained from the Medicine Department serum bank, from dogs with a blood urea above 20 mmol/l. Thirty serum samples from dogs whose blood urea had not been tested were used as a control group.

The indirect fluorescent antibody test was used to test these serum samples for antibodies against E. cuniculi. The group with high blood urea levels had a prevalence of 21,4% positive titres to E. cuniculi as compared with 6,7% for the control group.

The nephritis, chronic interstitial nephritis and pyelonephritis cases constituted 45% of the total group and had a prevalence of positive titres of 47%.

These results suggest that Encephalitozoon cuniculi is an important cause of nephritis in dogs.

FELINE PLASMA CELL GINGIVITIS-PHARYNGITIS

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The well known disease entities involving the mouth of cats include calicivirus infection, herpesvirus infection, panleukopaenia and feline leukaemivirus infection. A recent report on plasacytic gingivitis-pharyngitis has added a new dimension to the feline stomatitides.

The presenting signs of the above condition include salivation, halitosis and progressive weight loss. The lesions are characterized by severe submucosal plasma cell proliferation in the glossopalatine arches and, to a variable extent in the gums. Dental tartar is an occasional accompaniment.

A number of cases will be presented in which the epizootiological complications of the condition will be discussed, these include the possible infectious nature of the condition and the tendency to occur in animals with concurrent or predisposing infections or other conditions.

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EVALUATING THE EFFECTIVITY OF SELENIUM SUPPLEMENTATION USING GLUTATHIONE PEROXIDASE AS PARAMETER OF SELENIUM STATUS

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A nutritional deficiency of Selenium causes the so-called "white muscle disease". This is, however, misleading, because Selenium is involved with the maintenance of membrane integrity, so a deficiency does not affect muscle cells alone. In an animal suffering from Selenium deficiency, there is a significant decrease in the activity of the erythrocyte enzyme glutathione peroxidase, since this enzyme contains Selenium. Being closely related to blood Selenium concentration, erythrocyte glutathione peroxidase activity can be used as an index for the overall Selenium status of an animal. The effectivity of a Selenium supplementation program was evaluated by monitoring erythrocyte glutathione peroxidase activity, using the technique for determining glutathione peroxidase activity as described by Paglia and Valentine (1969). A trial on cattle was conducted at the Johannesburg Municipality Farm. The cows graze pastures irrigated with sewerage effluent containing high levels of sulphates and phosphates. These molecules bind soil Selenium, rendering it unavailable to plants, and thus causing dietary deficiencies in the cows. Bulls receiving concentrate supplements and calves of deficient cows were also monitored. Bulls were not deficient, but calves had low erythrocyte glutathione peroxidase activity. Both intramuscular and oral Sodium Selenite successfully corrected the deficiency.

OORSIG OOR PROEWE GEDOEN MET SEMENTOONDSTOF-INSLUITING IN VOEDING,
VAN BEESTE EN SKAPE

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Berigte was van die VSA in 1977 ontvang waar sementoondstof in rantsoene met lae proteïen en hoë ru-voer insluiting verbasende resultate getoon het. Met die ondersteuning van Portland Sement is besluit om soortgelyke proewe hier te doen.

Twee, onderhouds' voere is ontwerp, een met 3½% sementoondstof en geen minerale bygevoeg en die kontrole, 'n soortgelyke rantsoen, sonder sementoondstof maar met minerale toevoeging. Twee proewe is met 32 skape op hortjies gedoen en 4 proewe met beeste in die proefvoerkraal. Die behandelde skape het in een proef oor 42 dae, 1,87 kg meer gewigstoename getoon en die ander proef 7,1% beter voeromset.

Die beeste het uiteenlopende resultate getoon, sommige proewe swak en ander goeie resultate. Daar is gevind dat die ru-voer kwaliteit 'n groot rol speel en die laaste proef met ammoniakbehandelde strooi het 9,8% beter voeromset gehad. Nog proewe met rantsoene van hoë energie-en proteïenwaarde is nodig, verskillende beestipes, voordat finale antwoorde gegee kan word.

SUPEROVULATORY RESPONSE OF MERINO EWES TO THREE
DOSE LEVELS OF PREGNANT MARE SERUM DURING THE
BREEDING SEASON

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In this trial the ovarian response of Merino ewes to 3 different dose levels of pregnant mare serum was studied. Twenty-one Merino ewes were assigned to 3 treatment groups. Nine ewes in group A, 6 ewes in group B and 5 ewes in group C received 1,200, 1,000, and 500 iu PMSG im respectively, on day 13 after insertion of medroxyprogesterone acetate intravaginal sponges. All sponges were withdrawn on day 14. Ewes were laparotomized at different stages of the luteal phase. Ovarian activity, ova recovered and interval to the subsequent oestrus was recorded. Results are summarized in Table 1.

Table 1. Response of ewes superovulated with 3 dose levels PMSG (means \pm SD).

Dosage	Interval PMSG to oestrus	Corpora lutea	Unovulated follicles	Ova recovered	Ova ferti- lized	Days to next oestrus
1,200iu n = 9	48,2 h \pm 4,64	9,7 \pm 8,23	7 \pm 1,41	4,8 \pm 2,33 56,4%	4,2 \pm 3,15	24,1 \pm 6,60 n = 7
1 000iu n = 7	56,0 \pm 20h	6,3 \pm 5,50	5 \pm 1,15	1,7 \pm 1,98 49,2%	1,3 \pm 1.98	2 ewes developed cystic ovaries
500 n = 5	53,6h \pm 9,40	3,0 \pm 1,58	1,0 \pm 1,0	1,7 \pm 1,53 64%	1,0 \pm 1,0	20,5 \pm 2,38 n=4

Although 2 ewes in group B developed cystic ovaries the results are in favour of a 1 000 iu PMSG. More unovulated follicles occurred at 1,200 iu and low recovery rates were associated with high ovulation rates.

THE SIGNIFICANCE OF MORPHOLOGICAL ASSESSMENT OF BOVINE EMBRYOS PRIOR
TO CRYOPRESERVATION

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This trial examined the significance of morphological assessment of bovine embryos prior to cryopreservation, as reflected by the pregnancy rate obtained after transferring the thawed embryos non-surgically.

By non-surgical embryo recovery, 100 embryos and oocytes were obtained from 15 superovulated crossbred cows, 7 days after oestrus and insemination. The embryos were classified according to stage of development and embryo quality as indicated by cellular integrity, and uniformity of size and colour, and freedom from extraneous cells. Embryo quality was designated I to V, with I being excellent and V degenerate.

The 69 developing embryos classified I to IV were glycerolized in 6 steps to a final glycerol concentration of 10% in Whittinghams PB 1 solution. They were then packed in 0,25 ml plastic straws and cooled at a controlled rate from room temperature to - 35°C after which they were plunged into liquid nitrogen, where they were stored.

After some three months of storage, the embryos were thawed in a water bath at 30°C and the cryoprotectant removed, again stepwise.

Those embryos regarded as quality V post thaw were discarded and the rest (n = 53) transferred non-surgically to crossbred recipient cows seven days after synchronized oestrus. Thirteen pregnancies resulted. Of these, 12 resulted from the 38 embryos regarded as being of quality I before freezing, 1 from the 6 embryos assessed as II prior to freezing and none from those placed in lower categories (n = 25).

While falling below the success rate usually obtained by the transfer of fresh embryos, these results clearly indicate the value of careful assessment of embryo morphology prior to cryopreservation.

THE TRANSMISSION OF BLUETONGUE VIRUS BY EMBRYO TRANSFER IN SHEEP

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Intercontinental transfer of preimplantation embryos has many advantages over the transport of postnatal live animals. The problem of ensuring that the transported embryos are free from infectious disease has been a major factor preventing wider application of this technique for commercial purposes. This study was undertaken to determine whether bluetongue virus (BTV) could be transmitted by embryo transfer procedures in sheep.

In a series of experiments it was established that ewes were susceptible to infection with BTV via the intrauterine route, and that the infection could be transmitted to recipients of embryos co-cultured in vitro with BTV. Thorough washing of embryos failed to remove infective virus from them. Finally it was determined that BTV could be transmitted by the transfer of embryos recovered from viraemic donor ewes.

Electron microscopic examination of embryos exposed to BTV in vitro or in viraemic ewes failed to show evidence of infection of embryo blastomeres. It is suggested, however, that the surface structure of the zona pellucida is such that physical entrapment of virus particles is possible, even in the absence of absorption of BTV to the zona pellucida.

It is concluded that sheep are susceptible to intruterine infection with BTV, that the virus may become trapped in or adsorb to the zona pellucida of ovine preimplantation embryos, and that transfer of embryos recovered from viraemic ewes may be a means of transmitting BTV infection to the recipient animals. It would therefore be justified for importing countries to promulgate appropriate regulations.

DIE ETIOLOGIE VAN VERPLIGTE ANAËROBIESE BAKTERIEË IN UIERINFEKSIES

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Bacteroides, Eubacterium en Peptococcus spesies word dikwels aangetref in uierinfeksies. Die doel van hierdie navorsing is om die voorkoms en rol wat verpligte anaërobiese bakterieë in uierinfeksies speel te bepaal.

Anaërobiese melkmonsters is geneem van normale, subkliniese- en kliniese mastitiskwarte. Die isolering en identifisering van anaërobe is onder streng anaërobiese toestande gedoen.

Anaërobiese bakterieë kom meesal in kombinasie met fakultatiewe en mikroaërofiliese mastitispatogene bakterieë voor in uierinfeksies, maar nie in normale kwarte nie. Omstandigheidsbewyse wys dat anaërobe 'n rol speel, miskien as sekondêre mastitispatogene, in uierinfeksies.

MOET DIERE 24 UUR RUS VOOR SLAGTING?

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Die doel van die studie was om te bepaal of dit noodsaaklik is dat beeste wat oor kort- tot middelaafstande na 'n slagplaas vervoer word, onmiddellik na aankoms geslag kan word. Twee groepe van 50 beeste is gebruik. Bepalings is gedoen op een groep in die winter en die ander in die somer. Uit 'n groep van 50 beeste is drie groepe ewekansig gekies en die dag voor vervoer gebloeï en genommer. Vervoer na die slagplase het ongeveer drie ure geneem. Een groep (groep I) is so gou moontlik na aankoms by die slagplaas gebloeï en geslag. Groep II is ongeveer drie uur na aankoms gebloeï en geslag en groep III die volgende dag, ongeveer 24 uur na aankoms. Die karkasse is aan elektriese skokbehandeling onderwerp en die pH van die vleis 'n halfuur later en weer die daaropvolgende dag bepaal. Die hemo-/mioglobien inhoud van die vleissap is ook bepaal. Die volgende ontledings is op die bloedmonsters uitgevoer: hematokrit, totale plasma-proteïene, bloedureum-stikstof, kreatinienfosfokinase laktaat, glukose, totale lipiede, kortisol.

Bloedbepalings op die winter vervoerdier toon statistiese betekenisvolle verskille tussen waardes verkry by die voerkraal en op die slagplaas. Die verskille tussen groepe is nie betekenisvol nie. Geen betekenisvolle verskil is gevind tussen die drie groepe diere nie. Dus indien diere vervoer word in die wintersmaande is dit nie noodsaaklik dat diere vir 24 uur moet staan voor slagting nie.

ONDERSOEK NA DIE HOEFBOU VAN DIE PERD (Equus caballus)
IN SUID-AFRIKA

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** Abe Bailey Professoraat vir Perdegeneeskunde en
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Verskillende afmetings van die hoewe van perde word in verskillende streke van Suid-Afrika geneem. Doel van die ondersoek is om die normale bou van die hoef in Suid-Afrika vas te stel, verskillende streke met mekaar te vergelyk en om die stand van hoefbeslag in Suid-Afrika te evalueer.

Die volgende afmetings word met behulp van 'n hoefmeter en "Verniér" Kaliper geneem: Hoek van hoef; lengte van toon, kwarte en hiele; lengte van dravlak; breedte by hiele, breedste deel van dravlak en kroonrand.

Volgens resultate verkry is daar 'n duidelike verskil in hoefbou tussen die jaaroud perde en die ouer perde wat al 'n geruime tyd in aktiewe wedrenne deelneem. Die ouer perde se tone groei langer, hiele korter en hoek van hoef word kleiner. Die feit dat die ouer perde so gereeld beslaan word en die onvermoë van die hoefsmid is van die belangrikste bydraende faktore. Definitiewe resultate en implikasies sal bespreek word.

NAVICULAR DISEASE IN EQUINES

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A great deal of controversy surrounds the aetiology and pathophysiology of navicular disease in equines. Attempts have been made to prove that the primary pathogenesis is as a result of microthrombi in the navicular bone leading to the severe change seen radiographically. Attempts have also been made to medically treat clinically cases with warfarin. The aim was to increase the one stage prothrombin time by two to four seconds. Results were variable. Other workers have proposed that the aetiology is a primary bursitis with secondary changes occurring in the navicular bone as a result of the chronic nature of the inflammation. In addition it is thought that a change in conformation of the digits plays an important role in increasing or decreasing the load on the navicular bone. This research project is primarily designed to investigate and possibly confirm this hypothesis.

Fresh dead legs sawn off 3 inches above the carpus are being used. Much of this work is being done at the CSIR premises. The legs are placed in a press of extreme accuracy. A strain gauge measuring minute changes in strain is placed on the deep flexor tendon. A specific load is placed on the leg, the strain in the deep flexor measured. Radiographs are taken to calculate the angle that the deep flexor tendon makes around the navicular bone. With these results a pressure can be calculated between the deep flexor tendon and the navicular bone. By artificial means using wedges the shape of the hoof is changed. The above procedure is repeated and compared with the "normal". Raising or lowering the heels appears to have a significant effect on navicular bone pressure. Results will be presented and discussed.

HERBESETTING VAN MERRIES NA BEINDIGING VAN
DRAGTIGHEID WEENS TOEDIENING VAN PROSTAGLANDINE

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Tweelingdragtigheide is slegte nuus vir 'n volbloedperdeteler en die seisoen is van groot belang. Om dragtigheid te beïndig en die merrie so gou as moontlik weer in vul te kry, het ons twee groepe merries soos volg behandel:

Groep A: (11 merries, 26-31 dae dragtig) 5 mg Lutalyse is op 2 agtereenvolgende dae i/m toegedien.

Groep B: (9 merries, 39-50 dae dragtig) 5 mg Lutalyse is daaglik op 4 agtereenvolgende dae i/m toegedien.

Bloed vir progesteroonbepaling is daaglik van elke merrie versamel.

Groep A se merries was almal binne 3-5 dae na die eerste toediening van Lutalyse in oestrus. Agt het met hierdie oestrus beset geraak. Die ander was 16-17 dae later weer in oestrus. Twee het toe beset geraak. Al hierdie merries se plasmaprogesteroonpeile was binne 48 uur na die eerste toediening van Lutalyse 2 nmol/l.

Twee van Groep B se merries het nooit oestrus getoon nie - die een het draftig gebly. Die ander 7 was 4-6 dae na die eerste toediening van Lutalyse in oestrus. Een merrie het tow beset geraak. Vier merries was binne 16-23 dae weer in oestrus, waarvan net een beset geraak het. Hierdie 7 merries se plasmaprogesteroonpeile was teen dag 3-5 2 nmol/l. Die merrie wat geresorbeer het, maar die oestrus getoon het nie, se peil het gedaal tot 2,2 nmol/l. Die merrie wat dragtig gebly het, se peil het tot 11,2 nmol/l gedaal.

Beïndiging van dragtigheid met behulp van Lutalyse dag 35 is dus 'n praktiese prosedure vir die behandeling van tweelingdragtigheide.

PHYSIOPATHOLOGICAL STUDIES ON AFRICAN HORSESICKNESS

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Although there is a great deal of information about the epidemiology and prevention of African Horsesickness, the pathogenesis of the lethal pulmonary oedema with which the disease is associated is poorly understood.

Studies were therefore carried out in an attempt to (a) establish the significance of cardiogenic factors and of pulmonary membrane permeability factors in the development of pulmonary oedema, and (b) correlate the above with clinical, haematological and blood biochemical parameters.

Six susceptible ponies were infected with a virulent strain of African Horsesickness virus. The following were recorded daily before inoculation with virus, during the incubation period and during the course of the disease up to death.

- 1) EKG, haemodynamics (pulmonary arterial and carotid arterial), cardiac output, stroke volume
- 2) Respiratory function, blood gas and acid base values
- 3) Complete blood counts. Activities of AST, CK, LDH in serum; protein fractions of serum and thoracic fluid (at autopsy)
- 4) Full clinical examination of cardiovascular and respiratory systems

The following significant points emerged from these studies:

- 1) Haemoconcentration and leucocytopenia became severe during the last two days of the disease
- 2) Protein constituents of thoracic and pericardial fluid collected at autopsy corresponded closely with those of serum
- 3) The first indication of pulmonary dysfunction was a drop in the PaO₂
- 4) Other than a slight increase in heart rate, signs of cardiac involvement did not accompany the initial hypoxia
- 5) Pulmonary arterial and carotid arterial pressures did not rise above normal ranges at any stage of the disease

It was concluded that results supported the concept that in African Horsesickness an increase in the permeability of the pulmonary membrane was the primary cause of the pulmonary oedema, and that cardiogenic factors did not play a significant rôle.

In view of the lack of evidence of physical disruption of the pulmonary membrane, the exact mechanism of the increase in permeability remains unknown.

ASPECTS OF INTRAVENOUS FLUID THERAPY IN THE HORSE

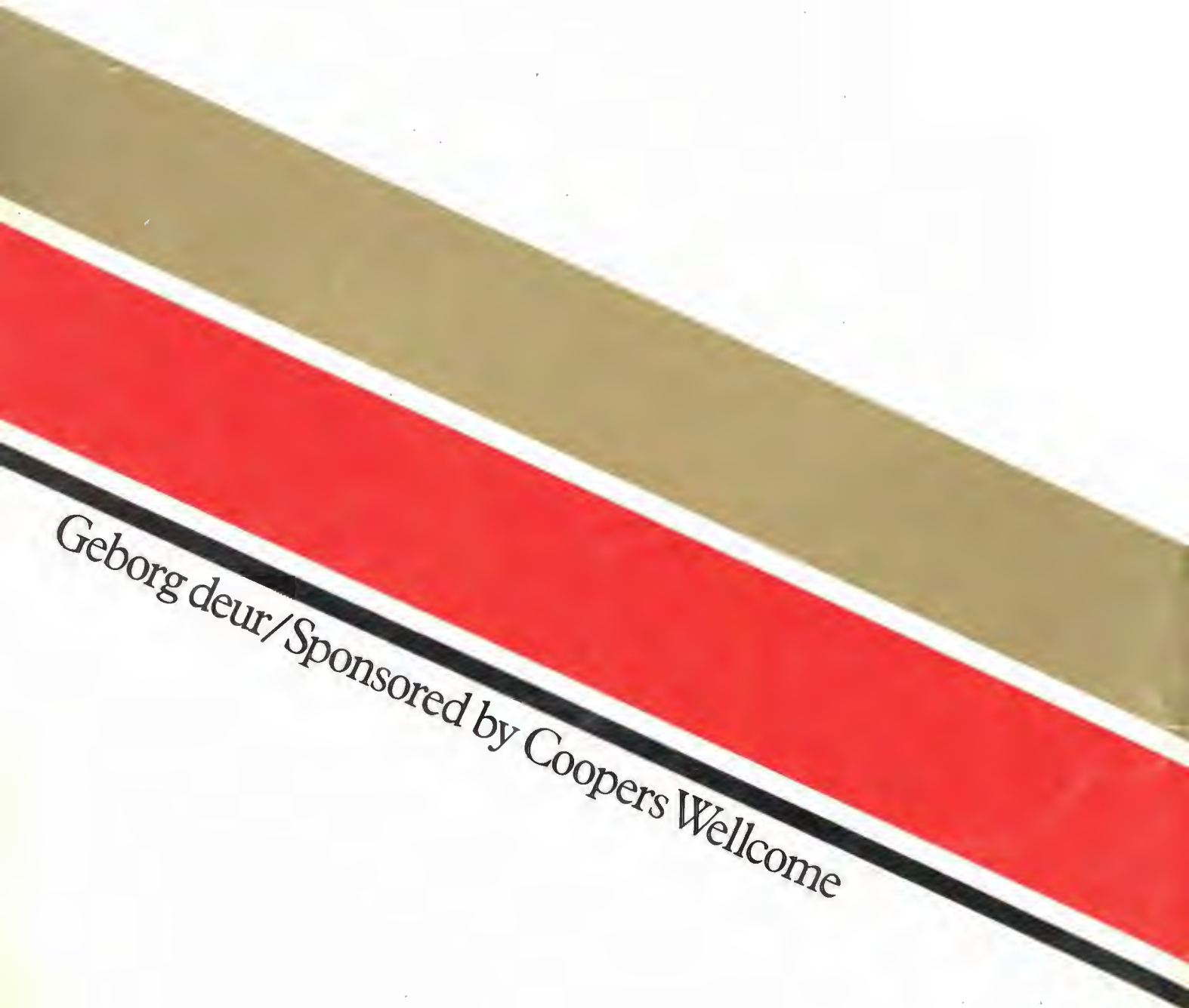
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A "home made" intravenous electrolyte solution was evaluated for any adverse effects and its influence on electrolyte homeostasis in horses.

In the first experiment a polyionic electrolyte mixture was used with deionised water and then repeated using pyrogen free water. The solutions were given intravenously to 2 groups of 2 horses each. A control horse was used with each group. Twenty litres were infused daily over an 8 hour period for 3 days. Urine and serum samples were collected from all horses twice daily for electrolyte and renal clearance studies. Blood in EDTA was collected three times daily from all horses for routine hematological examination. In a second experiment 2 horses received a commercially available polyionic solution, with a third again acting as a control. Sampling was done in the same way as in the first experiment. All fluids used were tested for the presence of endotoxin using the limulus amoebocyte lysate (LAL) test. Both groups of horses in the first experiment showed clinical signs of mild endotoxaemia on the second and third day. Depression, increased respiratory rate, muscle tremours, high rectal temperature and congested mucous membranes were noted during these periods. A severe drop in white cell count occurred in all horses exhibiting clinical signs of endotoxaemia. The horses in the second experiment did not develop symptoms of endotoxaemia. No fluctuation in white cell count occurred. Both types of reconstituted solutions were found to contain endotoxin, whereas the commercially available fluid was endotoxin negative.

Due to the fact that equines are known to be extremely sensitive to endotoxins, and that it is extremely difficult to render fluids and their containers, especially plastics, endotoxin free, it was concluded that horses could not be dripped safely with "home made" intravenous solutions.



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